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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE•



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The Weekly

Summary of

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DO YOU KNOW?

The River Nile is about 4,000 miles long from source to mouth.

Cottonseed oil is being used as fuel for combustion engines in the Congo.

Diesel engines for mine locomotives have been successfully used in Europe.

A survey of air pollution by smoke, pollen, and other materials is being made in New York City.

Optical lenses made of a clear plastic material are said to be unbreakable, scratch-proof, and quickly and cheaply produced.

The old-fashioned cooking rule that biscuit dough should be handled lightly to make tender biscuit is confirmed by recent laboratory tests.

A rattlesnake's age is not shown by the number of its rattles: the snake grows from two to four rattles on his tail in a year, and old ones sometimes break off.

It is reported that helium deposits have been found in various parts of the Soviet Union, and that a helium plant is to be started soon, to provide this valuable gas for Russian dirigibles.

In North Dakota, fires each year destroy over one-fifth of the value of farm buildings and equipment.

Finding soap gnawed by rats suggests to a government biologist that this apparent fondness for soap is the only clean characteristic a rat has.

Birds shed their feathers in the same way that animals shed hair, for both feathers and hair are specialized horny growths of the outer skin.

Papago Indians of Arizona are to keep their privilege of harvesting cactus fruit on land now included in the Organ Pipe Cactus National Monument.

Morning-glory, or bindweed, has roots as long as 30 feet, so that the unwanted plant lives persistently through drought conditions that kill valuable crops.

Cattle that graze continuously on the Great Plains in summer need at least seven acres of pasture per head, to feed them without injuring the vegetation.

A curious symptom of a rare nervous disease consists of a spasmodic hand gesture which is called medically by a German word meaning "fly swatting."

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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CHEMISTRY

What wealth does the sea swallow? p. 392.

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Do humans have a mating time too? p. 393.

GEOLOGY

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MEDICINE

Are some persons hypersensitive to tobacco? p. 393.

How can children be protected against scarlet fever? p. 393.

Is wheat germ a source of disease? p. 391.

What new triumphs are credited to protosil? p. 391.

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Why should those who take strychnine avoid whiskey? p. 388.

PHYSIOLOGY

Is the "safe period" method of birth control approved by the medical profession? p. 392.

What gland extract helps chronic tiredness? p. 398.

What new substance prevents blood from clotting? p. 388.

RADIO

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SEISMOLOGY

Is it possible that the lake behind Boulder Dam might cause earthquakes? p. 396.

ZOOLOGY

Do gibbons recognize their own voices on phonograph records? p. 397.

MURKIN

Jaundice Research May Give Clue to Arthritis Control

Disease Does Not Cure But Provides "Vacation" From the Pains of Muscular Type of Rheumatism

DISCOVERY that jaundice temporarily checks the progress of chronic deforming arthritis, suggests that this most crippling and disabling of all forms of chronic rheumatism can no longer be regarded as a relentlessly progressive, uncontrollable disease for which no really satisfactory remedy need be expected, Dr. Philip S. Hench, of the Mayo Clinic, Rochester, Minn., told members of the American Association for the Study and Control of Rheumatic Diseases meeting at Atlantic City.

No new method of treating arthritis is ready for application at present. Dr. Hench made this point very clear. The work is still in the experimental stage and many complex problems must be solved before the stage of treating patients is reached. Dr. Hench reported investigations on these problems which he has been carrying on since 1929.

"The time will come, perhaps in no distant future," Dr. Hench said, "when physicians will probably be able promptly and completely to eradicate the painful symptoms of this disease as well as those of chronic muscular rheumatism. When this time comes physicians will probably be able to control the progress of deforming arthritis much as diabetes is now controlled."

Relief

At the present time physicians can give considerable relief to sufferers with chronic arthritis and chronic muscular rheumatism by the use of various measures, the removal of infections, different types of vaccines and medicines, sometimes the use of special diets and particularly by the prolonged use of certain physical agents, such as heat and massage. Unfortunately for the present-day victims of rheumatism these measures, though generally successful in time, are often slow in producing their effects. Hence patients continue to hunt for a more dramatic relief, a "quick cure."

Scattered throughout this country there are at least 44 persons who had chronic rheumatism, sometimes severely, and who suddenly lost their symptoms almost overnight, Dr. Hench reported.

In behalf of those patients nature had pulled out of her sleeve a "new" and a "trick method" of helping them, and that method was—of all things—jaundice. Every one of these 44 rheumatic patients had developed a jaundice for various reasons, and when the jaundice became fairly intense suddenly their rheumatic pains, stiffness or swelling began to leave. Each of these patients immediately got a "vacation from rheumatism" which lasted anywhere from 3 weeks to 3 years. Then their symptoms came back, sometimes as bad as before, but often in a much milder form.

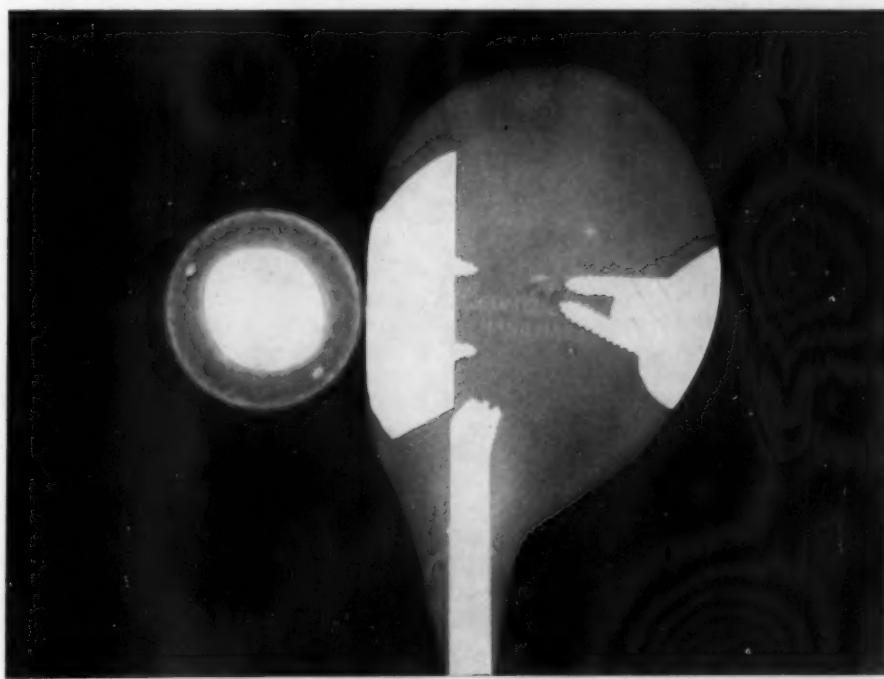
Nature's Secret

Hearing the story of these forty-four patients, and examining their joints and muscles during and after the jaundice, Dr. Hench became certain that nature was demonstrating a special brand of

rheumatism-control, not her usual rather lazy way of stopping the disease after weeks or months of discomfort. The remissions which jaundice precipitated came on quite rapidly, usually within the first three days after the jaundice became definitely visible. As one person expressed it, "When the jaundice came in the front door, the rheumatism went out the back door." Among those who have experienced this phenomenon all the patients with muscular rheumatism and two-thirds of those with chronic deforming—or as physicians call it, chronic infectious, atrophic—arthritis were completely, if temporarily relieved of their symptoms. One-third of the arthritic patients were notably but not completely relieved.

No One Type

Apparently no one type of jaundice is responsible for this effect, according to Dr. Hench. The phenomenon has resulted from jaundice due to a variety of causes but a "touch of jaundice" will not produce the beneficial effect, and a fairly intense jaundice is required. The remissions in symptoms, or "vacations from rheumatism" sometimes lasted like ordinary vacations—just a few days to three weeks, and then the rheumatism went back to work again on its victim.



WHAT'S INSIDE

Here's what golfers would see as they tee-off if they had X-ray eyes. The golf ball's core, the end of the steel shaft, the sole plate, weight and the screws that hold them together are all shown in this X-ray photograph made by Miss Francis M. Davis of Santa Monica, California

Often, however, the remissions lasted two or three, even four months and a few very lucky patients were free of their symptoms for two to three years. It is no wonder then that many of these patients were "glad of the trade" as one expressed it, preferring a spell of jaundice to their rheumatism. Although there was no set rule and many variations apparent, roughly the remissions in rheumatic symptoms lasted about twice as long as the jaundice.

Jaundice does not, however, relieve all types of pain nor does it relieve the pain of all types of joint and muscle diseases. Several patients with neuritis, with gouty rheumatism, or with rheumatism of other types were observed to have just as much pain when they developed a coincidental jaundice as they had prior to the jaundice. The phenomenon seems therefore to be somewhat specific for chronic deforming arthritis and for muscular rheumatism.

Because the rheumatic symptoms usually recurred, Dr. Hench warned that jaundice must be looked upon as providing not a "cure" but a temporary control of the disease. But the fact that nature actually does possess a method for a rapid satisfactory control affords most encouraging and important news. Nature's formula is so far her secret. Probably some chemical reaction that takes place during jaundice provides nature's accidental antidote for rheumatism. Several physicians are now trying to discover what the effective agent is and how it acts.

To Isolate Agent

Investigations are being carried out by Dr. Hench and his associates to isolate the agent so it may some day be available in the treatment of these maladies. At the meeting Dr. Hench reported his own investigations on the use of various constituents of bile, the use of transfusions of highly jaundiced blood, and the production of artificial jaundice. It is possible that the bilirubin, or coloring pigment of bile, or that the bile salts are responsible for the phenomenon. However, certain data suggested that not these, but other substances were responsible, at least in part. Although he has not yet been able to reproduce the phenomenon at will, Dr. Hench suggested that sometime in the near future the victims of chronic rheumatism may be more anxious to develop a "bilious look" than a fashionable coat of tan. He concluded:

"The development of a safe method of producing a harmless jaundice is

needed for the further solution of the problem, but when it is obtained it should be regarded not as an end in itself but as a means to an end. Even when 'artificial jaundice' is successfully accomplished it should at best be considered a crude and temporary form of 'treatment,' but it will take us one more step—an important step—on the way to the more refined treatment of the future."

Discussing the same problem, Dr. Harry E. Thompson of Tucson, Arizona, reported that he had noted the

phenomenon described by Dr. Hench. Investigating various methods to reproduce it he found that by injecting certain constituents of bile he was able to produce jaundice in a dozen rheumatic patients, each of whom noted relief from symptoms, in some cases for only a few days, in other cases for several weeks. If this method can be repeated successfully it will permit physicians to study the phenomenon much more closely and perhaps help them to isolate the responsible agent and utilize it for the future treatment of chronic arthritis.

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MEDICINE

Whiskey Deadly Poison to Those Who Take Strychnine

WARNING that persons who are taking strychnine as a medicine must not drink whiskey or other alcoholic liquor was given by Dr. Jack C. Norris, of Atlanta, Ga., at the meeting of the American Society of Clinical Pathologists in Philadelphia.

Strychnine and corn whiskey taken together are deadly poison even in relatively small quantities, Dr. Norris said. Both are depressing and both act on the same vital organs, affecting particularly the heart and breathing.

Whiskey deaths should be investigated to see whether the victim had swallowed strychnine also, Dr. Norris warned, because these two drugs have been used as poisons to commit murder.

"On one occasion the murderer admittedly gave his victim strychnine in whiskey as a friendly gesture, encouraging the victim all the while to take larger drinks of whiskey as a gesture of friendliness, and later followed his drunken victim down various streets watching him until convulsions and death occurred," the physician reported.

These two drugs have also resulted in accidental death.

A middle-aged man of good repute and fair health who had been a strychnine taker for a long period was found dead. It was shown that he had drunk corn liquor to the extent of about one half a pint shortly before death. There was also indication that he had simultaneously partaken of several strychnine tablets."

In experiments with animals, Dr. Norris found that every one given these two drugs, regardless of which one was ad-

ministered first, died in the next half hour to hour.

Here are some of Dr. Norris' conclusions:

1. Experimental evidence shows alcohol and strychnine both to be dangerous poisons acting somewhat alike on the brain and spinal cord, producing death by respiratory and cardiac failure.

2. Corn whiskey and strychnine in combination are lethal poisons.

3. Strychnine should be given with reducing dosages and rest periods, for continuance leads to accumulation with possible poisoning.

4. Persons who take strychnine should not take whiskey and whiskey drinkers should not take strychnine.

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PHYSIOLOGY

Substance in Sheep Brains Prevents Blood Clotting

ASUBSTANCE which keeps blood from clotting has been obtained from the brain of sheep and pigs by a method reported by Dr. Erwin Chargaff, College of Physicians and Surgeons, Columbia University. (*Science*, June 4).

The new substance probably does not owe its action to the presence of heparin, liver substance which also keeps blood from clotting.

Dr. Chargaff's discovery may shed important light on the whole vexed problem of blood coagulation as well as leading possibly to a means of preventing dangerous and even fatal clots within veins and arteries.

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SAND FENCE

Before these wind swept trees near Cape Hatteras the new brush sand fence is built in the hope of rebuilding a shifted sand dune.

GEOLOGY

Man-Made Sand Dunes Saving Carolina Seashore

WPA Under Direction of Park Service Is Creating Great Recreation Area and Halting Erosion of Shore

PLANES are again flying down on the lonely, barren seacoast around Cape Hatteras and not far from famed Kill Devil Hill at Kitty Hawk, North Carolina, where Orville and Wilbur Wright first proved that man could fly.

As these planes take off and land on the narrow strip of sand which keeps the Atlantic Ocean from rolling onto the mainland coast, their pilots look down at little dots that are clusters of human figures; clusters that break up, on closer inspection, into individual workmen.

Aside from the workmen, there is but one evidence of human activity on the stretch of sand and among the few tilted, stunted wind-swept trees. Running along the beach, mile after mile, are low sand dunes that bend back and forth in reverse curves and look like some giant snake buried by sand where he lay.

Man-made are those dunes that slowly are growing higher day by day. Man-

made, that is, in the sense that the guiding hand of engineers in the National Park Service is letting the ever-present winds of Cape Hatteras deposit sand at the proper places.

A closer inspection of the dunes shows the tops of brush sticking out of them and a visit a few weeks later will show how these brush fences gradually become buried as the top of the dune grows higher. Those human dots on the beach, as seen from the airplane, are transient workers erecting the sand fences, creating more dunes and saving what is probably the longest strip of virgin beach now left in the eastern United States.

Maybe not in the next six months, but not too far in the future either, the 175-mile strip of beach that begins just south of the Virginia-North Carolina line, goes around Cape Hatteras, and runs to Ocracoke Inlet will become a seaside recreational region. A bill submitted by Representative Lindsey C.

Warren of North Carolina is now before Congress proposing the establishment of "Cape Hatteras National Seashore," which would formally turn the beach preservation project into a public recreational area. The North Carolina beach project will already have cost some \$775,000 up to the end of June.

Convenient Area

In his office in the new Interior Department building, H. E. Weatherwax, assistant director of the National Park Service and coordinator of the beach preservation work, told why the Cape Hatteras region of the eastern seacoast was picked as the scene of the activity and described the way man makes the wind and sea undo some of the erosion damage which has been going on for the last century.

Cape Hatteras, indicated Mr. Weatherwax, picking up a map on his desk, is within 300 miles (one day's drive by automobile) of millions of people in the east central part of the United States. When the region is opened up Washington, Baltimore, Richmond and even Philadelphia will be only a few of the large cities whose residents can reach the area conveniently.

As little as sixty years ago the region was heavily timbered with pine, cedar and oak. Then came the lumbering operations and the much-repeated story that often follows in their wake. The land was stripped of its trees and cattle turned in for promiscuous grazing. The grass was thus kept short and in a few years there was no grass; only shifting, drifting sand that responded to every change in wind or wave movement. And so it is today; one of the most desolate and barren areas in the nation.

Depression-Made

If the depression had not come it is probable that sands of Kitty Hawk would still be untouched, for it was the depression and the need for made-work which first started off the beach preservation project. Originally it began as a work project of the North Carolina Transient Bureau and then went through WPA into the charge of the National Park Service. As many as 1,000 men have been employed at one time and 800 are now at work, declared Mr. Weatherwax.

These men are erecting brush fences which do the same kind of job with sand that the familiar snow fences of the north do for snow. Brush, gathered from nearby areas, is nailed vertically on a wooden framework and a sand

**BUILDING**

Workers for the National Park Service are erecting one of a series of sand fences designed to preserve the coast line from erosion by wind and water.

fence thus constructed. The fence is placed usually at right angles to the prevailing winds and the favored type of placement is in the reverse-curve, wavy line running down the beach. Soon sand has been deposited in a low mound until it covers the fence. Then the work is repeated by placing two fences, roughly parallel, at the borders of the first sand dune. Higher grows the dune and wider its base. Other sand fences are added as needed. The final step is to plant native grasses in the dune to hold it firmly and eventually native trees will be planted on the top to make it permanent.

Fore-dunes and dune ranges over 70 per cent. of the area, some 152 miles, are being created in what is probably man's largest project to fight the old men of the sea and wind.

Science enters the work through studies of wind speeds, the size of sand carried and records of the beach and off-shore underwater profile. Simple but ingenious sand traps have been erected that catch flying sand at levels up to three feet. Instruments for measuring wind velocity are operated in three shifts 24 hours a day.

Already it has been found that the formation of even a low fore-dune on a beach changes the underwater profile off shore and that the slope of the profile grows flatter and thus less likely to be menaced by water erosion. Already dunes 25 feet high and with a broad base of 180 feet have been achieved. The largest one has been developed directly in front of the Cape Hatteras lighthouse

to increase the protection of this most valuable marine marker.

Two airplanes are used by the Park Service for transportation in the desolate region. To get supplies across one roadless, 80-mile stretch of beach takes 10 hours by boat that hitherto has been the best means of transportation. By airplane the trip takes not more than 45 minutes; perishable supplies are thus transported in one-ton loads. The payroll, which one might also call a perishable cargo, goes the same way.

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ARCHAEOLOGY**Spain Gives War Lesson—Saving Nation's Relics**

SPAIN is giving the world a lesson in one angle of warfare.

Hot as fighting has been in Spanish civil war, the people have not deliberately "made war" on the national treasures of paintings, historic buildings, and museums.

True, the famous Alcazar in Toledo is wrecked. But the Alcazar, after all, was a fortress as well as palace, and even its 2,000 years of history would scarcely exempt it from its intended use.

Spain's officials have been practical enough to remove many art masterpieces and antiquities to safe hiding places. Public sentiment is also proving a safeguard against wanton destruction.

Word of the way Spain is handling this problem was received as rather glad news by the International Office of Mu-

seums, which recently held a conference on ways and means of protecting cultural objects from war damage.

People fighting a civil war are likely to be more reasonable about not tearing up their own country than foreign invaders would be, especially if the war is not sectional. Still, the Spanish attitude is regarded as something of a public example.

The museum officials feel that public sentiment is a real and powerful defense to protect from shell fire the world's museums, cathedrals, art galleries, and libraries. To this end they advocate greater effort to educate people to respect and admire fine things produced by civilization.

Meanwhile, the problem of protecting such structures from war is still studied. Fighting is developing along lines that threaten greater danger to buildings than ever before. One long-discussed project is to mark certain types of buildings with a special flag that would make them zones of peace. The museum experts urge that specialists in military tactics and in international law join them in an attempt to see whether any practical regulations can be worked out, that battling armies would respect.

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RADIO**Magnetic Storm Interferes With Trans-Oceanic Radio**

RAADIO communication across the Atlantic was somewhat interrupted Saturday night, June 5, and before daylight Sunday morning, RCA informed Science Service.

The cause apparently was a minor magnetic storm which was observed by scientists of the U. S. Coast and Geodetic Survey observatory at Cheltenham, Md.

This was the first significant magnetic disturbance since the very severe magnetic storm that occurred during the last week in April, which was one of the biggest on record. As a rule, these disturbances come about every 27 days, so that the recent one was nearly a week overdue.

Magnetic storms are correlated with unusual sunspot activity, and during them the aurora borealis often is visible well to the south of its ordinary zone.

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A new alloy that is extremely resistant to acids has been developed by combining nickel, iron, and molybdenum.

MEDICINE

Prontosil "Steals the Show" At Major Medical Convention

Warning Issued That New Dye Cure for Infections Is Not a Panacea; Wheat Germ Causes Cancer

PRONTOSIL, new chemical remedy that has already saved thousands of lives and promises to conquer four of mankind's major germ enemies, held the spotlight at the meeting of the American Medical Association in Atlantic City.

This red dye and its chemical relative, sulfanilamide, were the most important and most talked-of subjects on the program and around the convention hall. They even stole a place on the program from an older remedy.

Latest disease to go down before the attack of sulfanilamide is pyelitis, serious and troublesome urinary tract infection for which there has hitherto been no very successful treatment.

Cases of pyelitis which were completely cleared up by treatment with sulfanilamide were reported by Dr. Henry F. Helmholz of the Mayo Clinic, Rochester, Minn. This was the first report of the use of the new chemical remedy for this disease.

Dr. Helmholz was to have reported results of treatment with mandelic acid, but his results with sulfanilamide were so much better and so spectacular that he made a last-minute change in his paper in order to report the sulfanilamide treatment.

Meningitis, including the particularly deadly variety due to streptococcus infection of the brain membranes, as well as pneumonia, gonorrhea, childbed fever, and other diseases caused by streptococcus infection, all yield to treatment with sulfanilamide or Prontosil.

Hundreds of Cases

Reports of hundreds of similar cases are now ready for publication in the Journal of the American Medical Association, the editor, Dr. Morris Fishbein, declared.

The chemical is not an antiseptic and does not kill the disease germs. Its action apparently is to keep the germs from growing and multiplying in the patient's body. The body's own fighting forces are consequently able to overcome the infection, and the patient recovers.

Sulfanilamide is apparently particular-

ly effective in checking the growth of the round germs of the great "coccus" family. These include streptococci, pneumococci, meningococci, and gonococci. These bacteria are the causes of Type III pneumonia, for which there has been no such satisfactory serum treatment as there is in Types II and I; streptococcal meningitis, which up to now has always been fatal; gonorrhea, for which there has never been the specific treatment that there is for syphilis; childbed fever, which has killed thousands of mothers every year in spite of all efforts to check it; and the distressing and painful disease erysipelas. All have now been successfully treated by sulfanilamide or Prontosil.

This new chemical remedy was developed by a German chemist, G. Domagk. It was first brought to the attention of physicians generally by the English doctors, Leonard Colebrooke and Meave Kenny. Its first use in the United States was by Drs. Perrin Long and Eleanor Bliss of the Johns Hopkins University. Drs. Bliss and Long told the meeting of precautions necessary in the use of the remedy.

Warning

"Sulfanilamide is not aspirin and should not be used for every Tom, Dick and Harry of an infection," Dr. Long warned physicians attending the meeting.

The wave of enthusiasm for this drug is leading to its indiscriminate use by physicians all over the country for infections with many organisms other than the hemolytic streptococci, meningococci, gonococci and pneumococci. Commenting on this, Dr. Long said he was "terrified" at the probable result. It will not help diseases due to other organisms than those mentioned above and may produce toxic effects in the patients which will bring the remedy—so useful in some conditions—into general disrepute.

Dr. Long reported that dizziness, nausea, rashes, acidosis, cyanosis and acute hemolytic anemia have followed the use of the drug in some cases. It should only

be used for proved cases of streptococcal, meningococcal and gonococcal infections and then, Dr. Long declared, only under the closest supervision of a physician.

Wheat Germ Oil Causes Cancer

For the first time a product of vegetable origin is found guilty of causing cancer. Development of cancer in white rats as a result of feeding them wheat germ oil was reported by Drs. Leonard Rowntree, George M. Dorrance and E. F. Ciccone of Philadelphia.

This discovery means that scientists must search more deeply into the possibility of diet's playing a part in causing certain types of cancer. Heretofore, there was no proof that diet has a role in cancer causation. Even if wheat germ oil is a cause of cancer, it may be so changed in the cooking of whole wheat foods that its cancer-causing ability is destroyed. This is one of the points needing further investigation.

Wheat germ oil is one of the richest sources of vitamin E, the fertility vitamin. The discovery of the oil's cancer producing power was made in the course of studies in which the Philadelphia scientists wanted to give rats large amounts of vitamin E to study its effect. The cancer-causing part of the oil is not the vitamin, they stated. It may be related chemically to the artificially made cancer-causing chemicals called hydrocarbons, to the cancer-causing chemical in coal tar and possibly to the sex hormones.

TB Preventives

The importance of seeing that children get enough food and rest as one way of protecting them from tuberculosis is often overlooked, Dr. Ralph M. Tyson of Philadelphia emphasized in a discussion of childhood tuberculosis.

Physical examinations including tuberculin tests must be made on all school children if childhood tuberculosis is to be eliminated, Dr. Tyson said.

"Long hours in badly ventilated classrooms and college lecture halls, in stores and work rooms, together with a lack of recreation, irregular meals of poor quality and insufficient quantity and insanitary living in general are mainly responsible for the spread of tuberculosis in the adolescent," Dr. Tyson declared.

Difficult as it is to restrict the activities of growing children, Dr. Tyson continued, it helps materially in the prevention of tuberculosis.

Tuberculosis caused by infected milk, he reported, is be- (Turn to Page 398)

METALLURGY

Book Holds All World Knows Of Cast Iron and Steel

ALL THE world's knowledge of unalloyed steel and cast iron, gleaned in 50 years of research by more than 1,000 scientists, is packed into the 1,200-page, two-volume monograph announced by the Engineering Foundation.

The Engineering Foundation is the research agency of the national engineering societies, working in cooperation with the steel, automobile, chemical and other industries. The monograph, just completed, was compiled by the Iron Alloys Committee of the Foundation and is a synthesis of the world's entire knowledge of the subject.

The steel industry alone, states the Foundation in its report, spends more than \$9,000,000 a year on research and has \$6,000,000 invested in research and testing laboratories and equipment.

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PSYCHIATRY

Children May Seek Death Because They Want Love

LITTLE children are not all joyous carefree sprites filled with life and the joy of living. For some who are hardly beyond infancy, this world has already become an unbearable place.

In Bellevue Hospital, New York, in a children's ward are little youngsters aged from a mere six years to 13 who have attempted suicide and are, in the formal words of the physicians, "preoccupied with death."

Child suicides seem to have had but a slender hold on life. The reasons given for death attempts often appear trivial to an adult. Perhaps it was a bad report card and a parent's hasty reproof afterward. Maybe just disappointment at being unable to attend the circus or a party. Why should such a silly little matter precipitate such tragic action, we ask.

Looking behind the precipitating action, the underlying cause of child suicides has been sought by Drs. Lauretta Bender and Paul Schilder who have watched those children "preoccupied with death" at Bellevue's children's ward.

You will be surprised at the answer they have found.

Children attempt suicide because of spite. The child suicide wants to get even. Unconsciously, he may say to him-

self as so many children have said aloud, "You'll be sorry when I die!"

And that leads to another reason for child suicide—or rather the reason for the spite—urgent need for, and a feeling of lack of, love. Many of the children who go to Bellevue preoccupied with death are orphans. Some are unwanted children. Some feel that they are rejected because of physical disabilities.

Perhaps in their hearts these youngsters do not want to die. They may want only to try to kill themselves. They dream wistfully of hearts awakened at last to love and swift hands reached out to thwart them. To children, death is not irreversible; they may hope that death will serve to set their lives right again. For the orphans, these physicians suggest that the attempted suicide probably represents the desire to be again with the parents.

This paradoxical finding—little children trying to kill themselves out of spite, a spite caused by need for love—may offer new aid in the understanding of adult suicides as well.

Science News Letter, June 19, 1937

PHYSIOLOGY

Safe Period Birth Control May Destroy Marriage

CONTENDING that the safe period method of birth control, "because of the prolonged periods of continence necessary," tends to "destroy spontaneity in marriage to the extent it forces sexual relations contrary to the normal physiologic tides of desire," the *Journal of the American Medical Association* (June 5) in a leading editorial states that this method of birth control is in this respect antisocial and likely to destroy rather than to promote marriage.

Research by Dr. Prentiss Willson, Washington, D. C., physician, shows that in using this method the average woman "must be continent for about 234 days in each year, as against 65 days necessary for the one who is using adequate modern contraceptive measures."

"Until such time as its limits can be much narrowed and its exact timing more accurately determined," the *Journal* says of the safe period method, "it can be considered legitimately only as a method accessory and complementary to ordinary methods of contraception. The 'safe period' then, used in that way, and also as a guide in the prevention or cure of sterility, is a valuable and practical addition to medical knowledge."

Science News Letter, June 19, 1937



PSYCHIATRY

Chemists Watch Riches Flow Back Into the Sea

JUST as a small boy might look at a candy counter, or a bank robber look at the nation's gold depository at Fort Knox and think, "Boy, there's over a billion dollars in there," so too are chemists of the Ethyl-Dow Company watching sea water roll back into the ocean at Kure Beach near Wilmington, N. C. and wishing they had some way to obtain the wealth that is dissolved in it.

In the last 12 months nearly \$100,000,000 dollars slipped through the chemists' fingers as they pumped 158,735,000 pounds of sea water through the plant to extract several thousand tons of bromine.

But, at present, the task of the small boy wishing for his candy or the super-Jimmy Valentine stealing the Fort Knox gold cache, is far simpler than that of the chemists in tapping the sea water for more of its liquid wealth.

Over \$33,000,000 worth of salt (2,140,000 tons) went through the chemists' ocean-side plant as one example. While it might have been recovered the cost of doing this would have been greater than the \$33,000,000.

Similarly, technological difficulty plus unfavorable economics blocked the recovery of \$33,000,000 worth of magnesium; \$18,000,000 worth of Epsom salts; \$10,000 value in iodine; \$42,000 worth of gold and \$29,000 in silver, to mention only a few others.

By letting the bromine extraction, already economical, pay the way, the recovery of some of this wealth might be undertaken as a by-product. But technical recovery difficulties would still remain.

The bromine recovered has already found its way into the gasoline tanks of America's pleasure cars, trucks and busses. You, and you, and you have been using it during the past year. Some day your children's, children's children may use the other items of oceanic wealth.

Science News Letter, June 19, 1937

EE FIELDS

METEOROLOGY

Lightning Is Caused by Break-Up of Raindrops

See Front Cover

JUNE is a month for lightning. Some of its beauty is recorded in the photograph on the front cover of this week's SCIENCE NEWS LETTER.

Whence lightning? According to a widely accepted theory, supported by many observations and laboratory experiments, the electricity of lightning is found in the breaking up of raindrops. This condition is realized in a thunderstorm where the updraft is sometimes very violent. This turbulent stream of air ascending breaks up the falling drops, disrupting them and forming positive charges of electricity on them. Negative electricity is formed in the air where the disruption takes place.

There are four kinds of lightning due to differences in the electrical condition of the atmosphere. (1) The usual streak lightning speeding from cloud to cloud or cloud to earth. (2) Rocket lightning, where the lightning seems to be moving slowly like a skyrocket. (3) Ball lightning (balls of fire in the sky) is seldom seen. It seems to be an illusion or a variation of rocket lightning. (4) Sheet or heat lightning is really not a fourth kind; it is simply the illumination of a cloud or the atmosphere, by either streak or rocket lightning.

Science News Letter, June 19, 1937

FORESTRY

Toward Fundamentals In Technical Education

FORESTRY as a profession is showing signs of following a healthy educational lead set by engineering, in demanding of its young candidates solid foundations in basic principles rather than superstructure of detailed application. This trend receives approving comment in the *Journal of Forestry* (June).

The multiplicity of engineering courses that used to stuff college catalogues is being reduced largely because great industrial concerns, which are heavy "consumers" of engineering tal-

ent, have taken to training their own young men in special techniques, demanding only that they come prepared.

A big electrical company, for instance, prefers that its job candidates have their physics "down cold" and that they know the main outlines of electrical engineering thoroughly. It can teach them its own special designs and trick circuits.

Forestry schools, similarly, have had a tendency to a distractingly various lot of professional courses, until the student would lose track of general principles in his bewildered pursuit of a thousand particulars. He could not see the forestry for the individual courses in forestry.

Federal and state forest services, the Journal points out, hold a position analogous to that of the great industrial concerns. They are the principal employers of young graduates in forestry, and the types of their examinations will determine in large measure what courses the schools will offer. If forestry examinations demand fundamental education, that is what the schools will teach.

Science News Letter, June 19, 1937

EUGENICS

June Is Called the Ideal Human Mating Time

JUNE, month of brides, is the ideal time for human mating, Dr. Ellsworth Huntington, geographer and statistician, told the Eugenics Research Association meeting in New York City.

Men and women have their biologically best time of mating just as do the birds. This is indicated, Dr. Huntington believes, by a record of the births that occur during the months from January to March.

Of those who survive infancy, individuals born in March live, on an average, about four years longer than those born in July, Dr. Huntington said. In March, the number of boys born just about equals the number of girls. This is a good sign because it indicates better conditions for the health of the babies before birth.

Children born in the first three months of the year have a better chance to become intellectual leaders, Dr. Huntington said. Twins, which are in general a sign of biological weakness, are not usually born at this time of year.

Dr. Huntington did not give any credit to the stars or the calendar for this superiority of winter-spring babies. Sunshine, better diet, more comfortable temperature combine to aid the expectant mother's health for these babies, he

indicated, and it is to the advantage of the child's health to be conceived when both parents are in the very best physical and perhaps mental condition.

When parents are advanced in age at the time of the birth of their children, that may be a factor contributing to mental disease in the children, Dr. Alfred Gordon, of Philadelphia, told the same meeting. Dr. Gordon had examined 30 cases which showed little or no history of mental abnormality in the family. One or both the parents were above average age when patient was born.

Science News Letter, June 19, 1937

MEDICINE

Improve Inoculation Against Scarlet Fever

SCARLET FEVER protection for many more children will probably be the result of research reported by Drs. Richard A. Kern, Jean Crump and Rudolph L. Roddy of Philadelphia at the meeting of the Association for the Study of Allergy in Atlantic City.

A method of protecting children and adults against this disease by injections of scarlet fever streptococcus toxin, something like protective inoculations against diphtheria, was developed some years ago. Chief drawback to this scarlet fever immunization has been the fact that severe reactions often followed the protective inoculations. This was particularly true among persons who suffered from allergy, such as hay fever, asthma or food hypersensitivity. Parents and many physicians were reluctant to give the inoculations because of the chance the children would have considerable pain and be sick for a day or two.

The Philadelphia physicians have found that this can be overcome by a change in the way the inoculations are given. Injecting the material into the skin instead of under it gives protection, as shown by negative Dick test, without any severe reactions.

Tobacco Gave Rats Gangrene

Tobacco, it seems, is one of those things like strawberries, shell fish and certain pollens, for which some people have a special sensitiveness or allergy. Investigating the tobacco angle, Dr. Joseph Harkavy of New York tried injecting denicotinized tobacco into the peritoneum of rats. Gangrene of the animals' toes developed. The mechanism by which this occurs is tobacco sensitization, Dr. Harkavy reported today.

Science News Letter, June 19, 1937

GEOLOGY

Seeing Through Stone

Not Clairvoyance, But Development of a Technique For Slicing Rock Thin Enables Scientists to Look In

By DR. FRANK THONE

SEEING through a stone wall is an old folk-synonym for sheer impossibility.

The piercing eye of the lynx was credited, in medieval bestiaries, with this quasi-miraculous power, but it was not for the weak sight of mortal man. The walls of ancient castles may have had ears, but eyes they had not.

Thanks to the techniques of modern science, however, man of today can see through stone. X-rays are used for some of this rock-viewing, but that is only indirect seeing-through. For X-rays themselves are without effect on the eye; we must first make a photograph, or cast their shadow-pattern on a fluorescent screen, to see through things with X-rays.

Seeing directly through stone, using only ordinary sunlight and ordinary human eyes, can be done and is being done every day in a number of geological laboratories in this country. One of the most active of these laboratories is a part of the setup of the U. S. Geological Survey in Washington, D. C. Others are in various great museums, state universities, and a few in commercial establishments.

For seeing through stone is a highly practical business, in some of its applications. If you can get a microscopic view of the fine details of structure of a given piece of stone you can form a better judgment as to the load it will carry in a building, how well it can resist weathering or the effects of city smoke and acid fumes, and a number of other points of interest to builders.

Seeing through stone, like seeing through anything else, depends on the transparency of the particular sample you have in hand. Some kinds of stone are highly transparent in the natural state—common rock crystal, for example, and the more precious diamond. Glass might be thought of as a kind of artificial stone, with a similarly high transparency.

Colored Transparencies

Some stones, again, are transparent but colored. These are frequently valued as gems: emerald, ruby, amethyst, topaz. Color in a stone need not interfere seriously with its transparency: the world's finest monocle, according to tradition, was a large emerald mounted on a ring, which the emperor Nero used to aid his defective vision when he wanted to get a better look at a dancing-girl, or a Christian being chewed up by a lion.

But the great bulk of the world's common stones—the granites, marbles, slates, volcanic lavas, etc.—are not transparent at all, in the ordinary run-of-the-quarry specimen. Yet these are the materials of the world's mass industries in stone. Their inner secrets are the ones most important for science and engineering to know.

The secret of their opacity lies chiefly in the way they are put together. The



PHOTOMICROGRAPH

Here is a cross section of fossilized wood. Note the transition from dark-walled, small-celled summer wood to larger-celled spring wood of the following season. The large openings are probably resin canals.



SEEING THROUGH STONE

Ground thinner than the thinnest paper, the prepared slice of stone can be examined in its minutest details with the microscope.

rarer stones like diamond and emerald are transparent because each specimen is made of a continuous mass (usually crystalline) of a single kind of mineral. The submicroscopic bits of which it is made are all arranged in the same way, so that a beam of light can pass through without being all broken up.

The commoner kinds of stone, the workstones of the world, are more complexly formed than the transparent aristocrats of the jeweller's shop. Rocks of the granite type are made of innumerable fine crystals of several different kinds of minerals, arranged helter-skelter. Limestones and sandstones are made of only one or two kinds of mineral as a rule, but still arranged in helter-skelter particles. So light rays are reflected, bent back, some of them absorbed completely. Anyway, they don't get through; the stuff is not transparent.

If you could get a piece of one of these opaque stones so thin that the tiny crystals or other particles at any given spot were too few to quarrel with each other very effectually as to which way a beam of light should pass, the light

would come through with relatively little distortion; the chip would be transparent.

That is the job that the specialists in the laboratories (petrologists, these men call themselves) set about accomplishing. They would grind down pieces of stone so thin that they could see through them.

The first step in getting a piece of stone you can see through is to slice a chip, about a twentieth of an inch in thickness, of the specimen of granite, or marble, or diorite, or what have you. This is done with a wire saw. The wire is smooth, its "teeth" consisting of a small amount of emery dust, fed on loose. Faster than you might imagine, the saw bites off the chip.

The Long Grind

Then the stone chip gets its first rough grinding. It is held against a metal disk covered with emery and corundum powder, until it is about a seventieth of an inch thick. That is about as thick as a penny postcard. The stone is quite smooth by now, but it is not yet by any means transparent.

Now the real expert takes the chip, fastens it on a simple holder, and presses it again and again upon whirling disks of metal and leather, supplied with thin pastes of ever finer and finer abrasive powders. This final grinding is usually done by a man who could qualify as a jewel shaper and polisher. Frequently he is a graduate of the jewelry craft.

Thinner and thinner grows the little flake of stone. And the thinner it becomes the greater is the danger that it will be ruined just at the threshold of success. Some of the pieces have to be reduced to a thickness of a thousandth of an inch or less, and naturally they are rather brittle.

Paradoxically, the tougher and more resistant a stone specimen is, the better are your chances for getting a perfectly ground chip out of it. At the last thin stages of grinding the tough stones, like granite and fine-grained diorite, have most resistance to breaking, while a crumbly sandstone or a soft limestone becomes more and more difficult to hold in one piece.

At last the exacting job is finished. The grinder washes the muddy paste off his precious transparent wafer of stone, dries it, with his forceps carefully lays it on a glass microscope slide with a drop of Canada balsam to hold it fast. It is ready for the microscopist's eye and camera.

Patterns of snowflake delicacy and

beauty can be seen in some of these stone transparencies, radiating crystals like stars, or streaks of persistently dark stuff like reversed lightning. And he who sits in patience may read in microscopic tracery the promises of strength or the confession of hidden weakness.

The petrographer's skill is not all spent in the service of engineering and other applications of science. Some of the most fascinating research problems in paleontology, the study of ancient life on our earth, bring fossils to the grinder's wheel, so that the microscope may reveal fine details of internal structure, telling stories of plant and animal kinships millions of years ago and adding yet another inch to known territory on the map of evolution.

The availability of a fossil for this particular type of study depends in large part on how it was formed.

Not All Alike

Fossils are not all alike by any means. Some of them have little or no stony material in them. They are still the original plant parts or animal bones, preserved for ages in the acid water of a bog, or the oily tar of an asphalt pit, or frozen in the never-thawing soil of the polar regions. Some of these could be prepared by the stone-grinding process, but they will also respond to easier methods, so the laborious grinding is not used.

Other fossils are simply casts. The original bone or log rotted away in the mud where it was buried, leaving a cavity. Fine silt slowly trickled in, filled the cavity, and in time hardened into stone. Dinosaur remains are usually fossils of this kind. Fossil casts thus formed of infiltrating silt of course have no more internal structure than a plaster statue, so there is little use grinding pieces of them down, in an effort to find what isn't there.

A third type of fossils are true petrifications. Wood seems to be the best material for this kind of fossil-making. Real petrified wood apparently is usually, perhaps always, prepared by the burial of a living forest under a thick blanket of volcanic ash, such as fell

THREE STEPS

Part of the process in preparing the stone for the microscope are shown here. First it is ground down on a rather rough grindstone. Then it is mounted (center) on a table heated to keep the cement soft. Last it is smoothed on whirling abrasive disks.



when Mount Katmai in Alaska blew its top off a quarter of a century ago. The famous cliff of petrified trees in Yellowstone National Park shows on its face a dozen such eruption-whelmed forests, each growing above its predecessor's graveyard.

Wood thus buried decays very slowly indeed—molecule by molecule. And as each bit drops away the woody stuff is replaced, molecule by molecule, with mineral from the waters that trickle through the ash.

Thus even the minutest detail of inner structure is replaced in exact duplicate by stone of flinty hardness and often great beauty of color. It is ideal material for the petrographer's grinding apparatus.

Reduced to transparent flakes, these petrified woods can be identified by the microscopic details, just as wood from living trees can be identified by timber experts, without the aid of leaf or flower or fruit.

It is easy, for example, to tell whether these trees that lived when dinosaurs still trod the earth were related to pines and spruces and other evergreens, or whether their next of kin were broad-leaved trees like oaks and elms and maples. The distinguishing mark of the evergreen or conifer series are the curiously constructed openings from one long wood-cell into another, called border-pits. These are never found in the wood of broad-leaved trees.

Botanists hesitate to call exceedingly ancient petrified wood pine even though it looks like pine. So they compromise by calling the genus *Pinoxylon*, which is Greek for "pine-wood" or "pine-like-wood." There are quite a number of these extinct species which have been given names ending in the Greek *xylon*, meaning wood. But the scientist who named *Callixylon* must have seen something especially fine through his microscope, for that name means "beautiful wood."

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Science News Letter, June 19, 1937

SEASICKNESS

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SEASICKNESS

BIOPHYSICS

Molecules of Visual Purple Measured at Columbia

VISUAL purple, the chemical compound that enables us to see, has had its molecules measured for the first time, in the biophysical laboratory of Prof. Selig Hecht of Columbia University. (*Science*, June 11). Working with Prof. Hecht in the research were Drs. Aurin M. Chase and Simon Shlaer.

Indirect physical methods and mathematical inferences had to be used in the measurements, because the molecules of visual purple are far too small to see with any possible microscope. They have a most probable diameter of a little less than a hundred-thousandth of a millimeter. (A millimeter is approximately a twenty-fifth of an inch, or about the thickness of the lead in a pencil.)

At that, the molecules of visual pur-

ple are very large—for molecules. Their molecular weight is calculated at something like 800,000, as contrasted with weights of a few hundreds or even under 100, for most common substances. In both size and weight, the molecules of visual purple resemble protein molecules.

Visual purple is a reddish-purple liquid found in very small quantities in the finer structure of the retina, or light-sensitive film that lines the eye and is the essential organ of vision. Visual purple fades to colorlessness when exposed to light and recovers its color in the dark. Recently Prof. Hecht published a method for extracting visual purple from the eyes of frogs, and accomplished the color reversals outside the living eye, in a glass tube.

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SEISMOLOGY

Watch Great Dam for Quakes; Lake's Weight May Bend Rock

WILL the 41,518,125,000 tons of water backed up into Lake Mead by Boulder Dam cause earthquakes?

This question was raised before a meeting of the Seismological Society of America in St. Louis by R. R. Bodle of the U. S. Coast and Geodetic Survey.

The Colorado River in its lower course flows through a region where many violent earthquakes have occurred in the past, some of them comparatively recently. Scientists have wondered whether the vast weight of water that will be concentrated along the 115 miles of Lake Mead will put sufficient additional strain on the crustal rock layers to set off disturbances.

Mr. Bodle has devoted considerable study to the question, but stated that the data available are not sufficient to justify a positive answer one way or the other. He suggested that several seismograph stations be set up in the region, so that a better informed watch may be maintained over the earth's slow movements at this important place.

Machine-made indoor earthquakes were used at the Massachusetts Institute

of Technology to test instruments intended for use in earthquake regions, called accelerometers. They are so designed that they remain "asleep" until a strong earthquake wakes them up. Then they go into action and write a curve that records what happens.

The accelerometers were tested on a "shaking table," which is a platform so mounted that it can be moved back and forth in any horizontal direction, giving a very fair imitation of an earthquake. The tests were made by H. E. McComb of the U. S. Coast and Geodetic Survey and A. C. Ruge of the Institute staff. The records thus obtained will be useful for comparison with records made by the same instruments when they go through a real earthquake.

A Restless Deity

Indians in one earthquake-tortured part of the Republic of Colombia used to believe that the disturbances were caused by a great god who slept under the Andes. When he turned over in his bed, the earth shook.

This early theory of the cause of earth-

ORADIO

June 29, 4:15 p.m., E.S.T.

SCIENCE TESTS MATERIALS—C. L. Warwick, Secretary of the American Society for Testing Materials, and A. C. Fieldner of the U. S. Bureau of Mines.

In the Science Service series of radio discussions over the Columbia Broadcasting System.

quakes was mentioned by Rev. J. Emilio Ramirez, S. J., of St. Louis University, in his discussion of the actively seismic region in the Departamento de Nariño, on the southwest Pacific coast of Colombia. Ever since the days of the Spanish conquest there have been records of frequent earthquakes there, and the Indians had traditions of terrible earthshakings before the white men came.

This uneasy region is about the size of Belgium, Father Ramirez said, and it has half a million population. Since the region is very mountainous, calamitous landslides, floods, and mudslides sometimes lend additional horror to the more direct effects of the quakes.

Insurance Trouble

Earthquake science, or seismology, has a number of practical aspects, and research in it must be pursued without let-up because of the importance of certain unsolved problems.

This was indicated in an address by Captain N. H. Heck of the U. S. Coast and Geodetic Survey.

Some companies refuse to write insurance in regions with an earthquake history, said Capt. Heck. Insurance rates are always calculated on the statistical chances of a certain type of trouble happening at a given definite place within a unit time period. But although it is possible to say that earthquakes are likely to happen in a given general region, say the Andes or southern Italy, it is impossible to pin them to a definite locality, say Lima or Naples. And guess-

ing at time is even worse; it is absolutely impossible to make an honest and accurate time-forecast of an earthquake.

Nevertheless, the data accumulated by earthquake research even now have considerable value in practical affairs. Knowledge that a region is "seismic" that sooner or later a severe earthquake is likely to occur, enables government officers and Red Cross workers to concentrate staple relief supplies at strategic transportation centers and to form-

ulate "plans of battle" to go into effect when the attack comes.

Study of instruments and of skyscraper models set up on "shaking tables" in engineering laboratories have enabled architects to correct certain weaknesses in specifications for buildings to be erected in earthquake regions. These researches are still in active progress, so that further advances may be expected.

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ZOOLOGY

Records of "Gibbonese" Made in Jungles of Siam

FIRST phonograph records of the "language" of the gibbon, key animal in the evolution of man, have been made this spring in the mountain forests of northern Siam by an expedition from Harvard University, the Johns Hopkins University, and Bard College.

They are expected to constitute one of the more important aspects of the expedition's pioneering first-hand study of the natural behavior and physical character of the Asiatic anthropoids. From the expedition as a whole the group hopes to glean important new clues to man's early development and the jungle origins of his social systems that will aid in unraveling some of the more puzzling problems of human evolution.

To this end the seven American scientists comprising the party are applying modern psychology, sociology and anatomy to their examination of the gibbon's home life, testing primarily the position of the gibbon on the family tree of the anthropoid apes and even of man.

Similar to man physically, the gibbon is gregarious and monogamous as well, facts that lead scientists to believe that in his natural habitat they may find traces of the origins of man's most firmly established institutions, his family and group life.

Despite numerous difficulties, including a brush fire that nearly wiped out the base camp on Mt. Angka, the expedition's investigations have thus far been very successful, declares Harold J. Coolidge, Jr., of the Harvard Museum of Comparative Zoology, leader of the group. It left this country in January and has been in the field since March.

Judicious use of blinds and screens have enabled the scientists to approach

within close range of the animals without disturbing them. Detailed photographs of their activities have been obtained in addition to the pioneer phonograph records.

These records are usually clear and are so accurate that when they were played back to the gibbons, the animals responded immediately, varying their reactions as each new call came from the loudspeaker. The expedition hopes to continue these valuable recordings until a complete catalogue of all the major vocal patterns of the gibbon is obtained.

Dr. C. R. Carpenter of Bard College, who made the recordings, has also conducted detailed observation of 16 family groups of wild gibbons as well as a dozen captive animals in the expedition's camp.

Other members of the party, assisted by native hunters, have collected a series of gibbons for study of anatomical and

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morphological problems. Some of these specimens were obtained in prenatal stages and are expected to be especially valuable in comparative embryology.

Dr. Carpenter is still in Siam and will remain there until the rainy season sets in in July, but the rest of the group have now gone to British North Borneo to study orang-utans, gibbons and proboscis monkeys. Members of this group are Prof. Adolph H. Schultz of the Johns Hopkins University, Sherwood H. Washburn of Cambridge, J. A. Griswold of the Harvard Museum, Andrew Wyllie of Washington, and John T. Coolidge of Milton, Mass., the party's photographer. Various members will later visit Java and Sumatra.

Cooperatively financed by the Carnegie Institution, the Milton and Sheldon funds of Harvard, the Columbia University Council for Research in the Social Sciences, and from several private donations, the studies are expected to provide a much-needed control for laboratory observations made of these animals.

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From Page 391

coming rare as a result of inspection and testing of dairy cattle and the pasteurizing and boiling of all milk.

Aid to Singers

The "vitally important" role of the throat specialist in the training of a singer was described by Dr. Robert F. Ridpath of Philadelphia. Dr. Ridpath urged fellow throat specialists to make a special study of the art of voice cultivation. A great many "vocal tragedies" could be avoided by the informed physician, Dr. Ridpath said.

Most singing teachers try to make sopranos of all girls, he pointed out, and tenors of all men. The character of the voice, however, is determined by anatomical features that no amount of training can change, Dr. Ridpath declared. Among these are the size, shape and length of the vocal cords and especially the time of adolescence. The tenor matures early; his larynx (voice box) grows quickly and the vocal cords are short. Similarly, the earlier adolescence comes in the girl the shorter her vocal cords and the higher her voice is pitched.

The tenor and soprano are short, Dr. Ridpath pointed out. Baritones, bassos and contraltos are of large build and tall.

The general health of the singer is important and the physician should

watch this as well as the voice producing apparatus. Loss of sweetness of tone, development of a tremolo, hoarseness and shrillness are danger signals and their neglect may lead to vocal ruin.

"By periodic examinations the physician can see and sometimes forestall such conditions as inflammation of the cords, vocal nodules, relaxation of the cords and other ills that afflict singers," Dr. Ridpath concluded. "That the physician is finally called on to treat the pathological condition is to be deplored because the mischief may be beyond repair—the mechanism being permanently damaged."

Hospital Insurance Opposed

Group hospital insurance, now in effect in many parts of the country, is a first step toward state medicine. This warning appeared in a report of the association's bureau of medical economics, which has been studying this and other related problems. The danger, according to the report, lies in the fact that hospital contracts under these insurance plans cannot be limited to essential hospital services but must include medical services, such as anesthesia, clinical laboratory diagnostic tests, X-rays and radium treatments and physical therapy.

While the general public may not see danger in state medicine, the report points out two other dangers in group hospital plans that are easily seen to concern the man in the street. One is that group hospitalization is actually a form of insurance coverage, "yet actuarial data on which to base sound premium rates are not available."

The second danger is that group hospitalization plans are getting away from the original altruistic purpose of assisting persons of limited means to secure necessary hospital service and are being used as devices to fill vacant hospital beds and augment hospital income.

A post-payment plan for those really unable to pay their hospital bills, instead of the insurance prepayment plans, was recommended by the bureau. Medical societies in some communities have developed this kind of plan with an administration cost of about 10 per cent, it was explained, whereas the administration of group hospitalization plans costs from 12 to 40 per cent.

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There are over 400 kinds of lilacs growing in the grounds of the Arnold Arboretum, of Harvard University.

Aztec Indians of Mexico knew the poisonous black widow spider, and used an oil extracted from it in medicines.

PHYSIOLOGY

Two New Gland Hormones Affecting Sex Discovered

TWO NEW hormones, one of which brings maturity to sexually underdeveloped boys, were announced to the Association for the Study of Internal Secretions at Atlantic City.

The adrenal glands produce the new hormones, discovered by Drs. F. M. Pottenger, Jr., and D. G. Simonsen of Monrovia, Calif.

The maturing effect was discovered accidentally in the treatment of nine boys suffering from asthma. The California doctors gave an adrenal gland extract to these lads to relieve their asthma and unexpectedly found that after treatments of from three months to a year, the boys, who had all been underdeveloped sexually, all matured.

The new hormone also had a remarkable effect on a sixteen-year-old mentally retarded boy whose sexual development "was that of a new-born baby." After one month's treatment this boy's development had increased several times the original, and the boy had made a marked advance in his mental condition.

The other hormone, when tried in rats, made males more virile but caused the sex glands of females to shrink and waste away.

Cortin Helps Chronic Tiredness

Patients suffering from chronic tiredness, weakness, low blood pressure, vague digestive troubles, and minor but persistent nervous complaints were very much improved by treatment with another adrenal gland hormone, Drs. E. S. Gordon, M. S. Kimble, and E. L. Sevringshaus of the University of Wisconsin Medical School reported. The addition of from two to four teaspoonsfuls of table salt to the daily diet added to the improvement brought about by the hormone treatment.

The hormone used for these patients is the recently discovered cortical hormone, sometimes called cortin, which makes life possible for Addison's disease patients, as insulin does for diabetics. The Wisconsin scientists emphasized that their work showed that other patients besides those suffering from Addison's disease are benefited and enabled to lead useful lives when given this hormone treatment.

Science News Letter, June 19, 1937

The amount of steel in use in the United States is over a billion tons, for the first time in the country's history.

'First Glances at New Books'

Additional Reviews
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Psychology

PERSONALITY, ITS DEVELOPMENT AND HYGIENE: AN OUTLINE OF MODERN APPROACHES TO THE STUDY OF HUMAN NATURE—Winifred V. Richmond—*Farrar & Rinehart*, 279 p., \$2. This swift-moving work of a psychologist at St. Elizabeth's government hospital for the mentally ill, is intended as a textbook for students of mental hygiene, but it will also be welcomed by interested laymen.

Science News Letter, June 19, 1937

Animal Husbandry

PORK PRODUCTION (Rev. ed.)—William W. Smith—*Macmillan*, 575 p., \$3.75. Breeding, feeding, judging, marketing and pork economics—just about everything a practical hog farmer needs to know.

Science News Letter, June 19, 1937

Zoology

ANIMAL COMMUNITIES IN TEMPERATE AMERICA AS ILLUSTRATED IN THE CHICAGO REGION. A STUDY IN ANIMAL ECOLOGY—Victor E. Shelford—*Univ. of Chicago Press*, 368 p., illus., \$3. A second printing, with addition of an annotated bibliography, of a book that has been standard in the literature of animal ecology since its first appearance in 1913.

Science News Letter, June 19, 1937

Physiological Chemistry

VITAMINS, MINERALS AND HORMONES—Albert P. Mathews—*William Wood*, 97 p., \$1.50. Three chapters reprinted from Prof. Mathews' larger work, Principles of Biochemistry. Since this is a college textbook, the reprint will prove too technical for most lay readers but will undoubtedly find a welcome from many scientific readers.

Science News Letter, June 19, 1937

Science Teaching

SCIENCE IN THE ELEMENTARY SCHOOL, INCLUDING AN ACTIVITY PROGRAM—W. C. Croxton—*McGraw-Hill*, 454 p., \$3. Coming from the Minnesota State Teachers College, this book is intended for use by elementary teachers. In addition to the discussions of method and practice in the first part, there are over three hundred pages of inviting science projects which both teachers and pupils should enjoy.

Science News Letter, June 19, 1937

Economics

REPORT OF THE INQUIRY ON COOPERATIVE ENTERPRISE IN EUROPE, 1937—*Govt. Print. Office*, 321 p., 65c. A compre-

hensive and useful study of how consumers run their own business in Europe, with evaluations as to what this means to the American scene. This government inquiry gives information which will be of use to those who are forming their own opinions on cooperative enterprise.

Science News Letter, June 19, 1937

Child Care

CHILD CARE AND TRAINING (4th ed. rev.)—Marion E. Faegre and John E. Anderson—*Univ. of Minnesota*, 327 p., illus., trade ed., \$2.50, text ed., \$2. This revised edition of a popular handbook from the University of Minnesota follows the same plan as former editions. New material, including a chapter on social development, has been added.

Science News Letter, June 19, 1937

Zoology

THE SCIENCE OF ANIMAL LIFE—Arthur Ward Lindsey—*Harcourt, Brace*, 656 p., \$3.75. A very solid, steadily-flowing presentation of animal biology for students of college level. It begins with simple general principles and concludes with an effort to apply biological doctrine to problems in present-day human society.

Science News Letter, June 19, 1937

Zoology

WHO'S WHO IN THE ZOO: NATURAL HISTORY OF MAMMALS—Ralph De Sola, ed.—*Halycon House*, 211 p., illus., \$1.69. A very well done picture book of animals in the zoo (specifically the New York Zoo, but really any zoo will do) prepared by workers of the WPA Federal Writers' Project in New York City. Photographs and block cuts are supplemented with informative text.

Science News Letter, June 19, 1937

Botany

A GUIDE TO THE SPRING FLOWERS OF MINNESOTA—Carl Otto Rosendahl and Frederic K. Butters—*Univ. of Minn.*, 91 p., \$1. A very compact yet very adequate state flora, with good workable keys and clean-cut line illustrations. It well merits going into this, its seventh edition.

Science News Letter, June 19, 1937

Vocational Guidance

MEN WANTED: THE NEW OPPORTUNITIES AND WHAT THEY DEMAND—Frances Maule—*Funk & Wagnalls*, 290 p., \$2. A book on vocational guidance with an introduction by Edward R. Stettinius, Jr.

Science News Letter, June 19, 1937

Psychology

MEASURING INTELLIGENCE: A GUIDE TO THE ADMINISTRATION OF THE NEW REVISED STANFORD-BINET TESTS OF INTELLIGENCE—Lewis M. Terman and Maud A. Merrill—*Houghton, Mifflin*, 461 p., \$2.25. For twenty-one years Dr. Terman's "The Measurement of Intelligence" has remained a classic in the science of psychometrics. This new guide to the administration of the revised Stanford-Binet test of intelligence may be expected to occupy a similar place in future years.

Science News Letter, June 19, 1937

Chemistry

QUALITATIVE ANALYSIS AND CHEMICAL EQUILIBRIUM—T. R. Hogness and Warren C. Johnson—*Holt*, 417 p., \$2.75. A college text from the University of Chicago.

Science News Letter, June 19, 1937

Physics

A COLLEGE TEXT-BOOK OF PHYSICS (5th ed.)—Arthur L. Kimball, revised by Peter J. Wold—*Holt*, 729 p., \$3.75.

Science News Letter, June 19, 1937

Photography

HOME PORTRAITURE—H. G. Russell—*Greenberg*, 108 p., \$1.50. Not a book for professionals or experienced amateurs, this work does contain some suggestions on lighting, composition, etc., which may be helpful to the beginning snap-shooter. The photographs used as examples were apparently made under difficult home conditions.

Science News Letter, June 19, 1937

Hygiene

A WORKBOOK IN HEALTH FOR HIGH SCHOOL GIRLS—Gladys B. Gogle—*A. S. Barnes*, 267 p., \$1. The book is intended to be supplemented by reading, the students thus investigating the problems suggested in the workbook and finding the answers themselves. This approach may inspire greater interest in what often appears a very dull subject in the high school curriculum, and may accomplish the objective of having the student practice the principles she learns.

Science News Letter, June 19, 1937

Medicine

A TEXTBOOK OF NURSING TECHNIQUE: A MANUAL USED IN THE ASSOCIATED HOSPITALS IN THE UNIVERSITY OF MINNESOTA SCHOOL OF NURSING (3rd ed. rev.)—Marion L. Vanner and Barbara A. Thompson—*Univ. of Minnesota*, 277 p., illus., \$2.50.

Science News Letter, June 19, 1937

*First Glances at New Books

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Physics

ATOMIC STRUCTURE OF MINERALS—W. L. Bragg—*Cornell Univ.*, 292 p., \$3.75. This book, written while the author was the Baker non-resident professor at Cornell, is a discussion of mineralogy from a viewpoint of a vast wealth of new information made available by the successful application of X-ray crystal structure analysis to crystalline minerals. It will be of interest to chemists and physicists as well as mineralogists.

Science News Letter, June 19, 1937

Astronomy

A BEGINNER'S STAR-BOOK: AN EASY GUIDE TO THE STARS AND TO THE ASTRONOMICAL USES OF THE OPERA-GLASS, THE FIELD-GLASS AND THE TELESCOPE (4th ed. rev.)—Kelvin McKready—*Putnam*, 154 p., illus., \$3.50.

Science News Letter, June 19, 1937

Philosophy

COOPERATION, ITS ESSENCE AND BACKGROUND—Fletcher Durell—*Bruce Humphries*, 76 p., \$1. A mathematician here outlines what he terms a science of cooperation.

Science News Letter, June 19, 1937

Psychology

THE SOURCE OF CIVILIZATION—Gerald Heard—*Harper's*, 431 p., \$3.50. The section heading, "All at stake and just time," appears to express the attitude of the author toward what he considers civilization's crisis. He believes that "traditional religion, academic psychology and psychical research are none sufficient" but recommends "a psychological praxis."

Science News Letter, June 19, 1937

Sociology

CASTE AND CLASS IN A SOUTHERN TOWN—John Dollard—*Yale Univ.*, 502 p., \$3.50. This publication of Yale University's Institute of Human Relations presents a dramatic picture of "Southern town," which fictitious name is applied to a small town of about 2,500 people selected for this research as typical of Southern life. Because of their close interaction, both sides of the caste-dividing line, the railroad track, are included in the study.

Science News Letter, June 19, 1937

Psychology

DIFFERENTIAL PSYCHOLOGY: INDIVIDUAL AND GROUP DIFFERENCES IN BEHAVIOR—Anne Anastasi—*Macmillan*, 615 p., \$2.75. Interesting and novel is the ap-

proach of this college textbook beginning with a historical introduction showing the rise of interest in individual differences. The author goes on to discuss differences due to heredity and environment, to training, to constitutional types, and to individual defects. Group differences, sex differences, racial differences and differences between urban and rural populations are also discussed.

Science News Letter, June 19, 1937

Vocational Guidance

FINDING YOURSELF IN YOUR WORK: A GUIDE FOR CAREER AND PERSONALITY—Harry Walker Hepner—*Appleton-Century*, 297 p., \$2.75. Check lists on which you can score your mental and vocational assets, mental tests for self administration, and vocational interest blanks that you may fill out, combine to make this volume intensely interesting to anyone attempting to plan a career. Attractive drawings add to its entertainment.

Science News Letter, June 19, 1937

Psychology

LATER CRIMINAL CAREERS—Sheldon and Eleanor Glueck—*Commonwealth Fund*, 403 p., \$3. This book is a sequel to the authors' "500 Criminal Careers." A re-study of these 500 former inmates of the Massachusetts Reformatory seems to point to a two-fold division among delinquents. Some are drawn into crime through the accident of environment; others appear to be tainted by mental or emotional disease. For the accidental criminal the authors hold out much hope. What can be done for the defective remains to be discovered.

Science News Letter, June 19, 1937

Chronology

THE WORLD CALENDAR: ADDRESSES AND OCCASIONAL PAPERS CHRONOLOGICALLY ARRANGED ON THE PROGRESS OF CALENDAR REFORM SINCE 1930—Elisabeth Achelis—*Putnam*, 189 p., \$2. The calendar reform advocated in this book is the twelve-month, equal-quarter plan, with mid-year and year-end days to absorb the two days "left over."

Science News Letter, June 19, 1937

Engineering—Photography

THE LOCOMOTIVE (ITS ESTHETICS)—Raymond Loewy—*Studio*, 125 plates, \$2.50. If locomotives hold a fascination for you, you will like this book crammed with photographs of many modern types as they run over the tracks of many nations.

Science News Letter, June 19, 1937

Mathematics

ELECTRICITY AND MAGNETISM: AN INTRODUCTION TO THE MATHEMATICAL THEORY—A. S. Ramsey—*Cambridge (Macmillan)*, 267 p., \$3.25. A textbook for first and second year university students, covering the fundamental principles of electrostatics, Gauss' theorem, Laplace's equation, systems of conductors, homogeneous dielectrics and the theory of images, steady currents in wires, elementary theory of the magnetic fields, and the elementary facts about the magnetic fields of steady currents.

Science News Letter, June 19, 1937

Education

EARLY CHILDHOOD EDUCATION, IN PRINCIPLES AND PRACTICES—Ruby Minor—*Appleton-Century*, 763 p., \$3. The Director of Kindergartens and Elementary Education of the public schools in Berkeley, Calif., offers this textbook to student teachers. The author is not an advocate of the newer freedom, nor is she an ultra-conservative, but emphasizes the importance of the kindergarten-primary school as a place where children may be undisturbed in natural growth but where they may also receive education.

Science News Letter, June 19, 1937

Educational Sociology

THE SOCIAL FUNCTIONS OF EDUCATION—Robert M. Bear—*Macmillan*, 434 p., \$2.25. This textbook in educational sociology is written by the Assistant Professor of Psychology at Dartmouth College. Education in its broader sense, not merely as confined to the schools, but including such matters as recreation, religion, and even propaganda, is discussed.

Science News Letter, June 19, 1937

Autobiography—Surgery

LIFE AND DEATH: THE AUTOBIOGRAPHY OF A SURGEON—Andrea Majocchi—*Knight*, 300 p., \$2.75. The eminent Italian surgeon who is the author of this book has filled it with colorful and dramatic episodes which together with a lively style make highly entertaining reading.

Science News Letter, June 19, 1937

Ophthalmology

GLAUCOMA AND ITS MEDICAL TREATMENT WITH CORTIN; MYOPIA, ITS CAUSES AND PREVENTION—Emanuel M. Josephson—*Chedney Press*, 92 p., \$3. A technical book for ophthalmologists and physicians.

Science News Letter, June 19, 1937